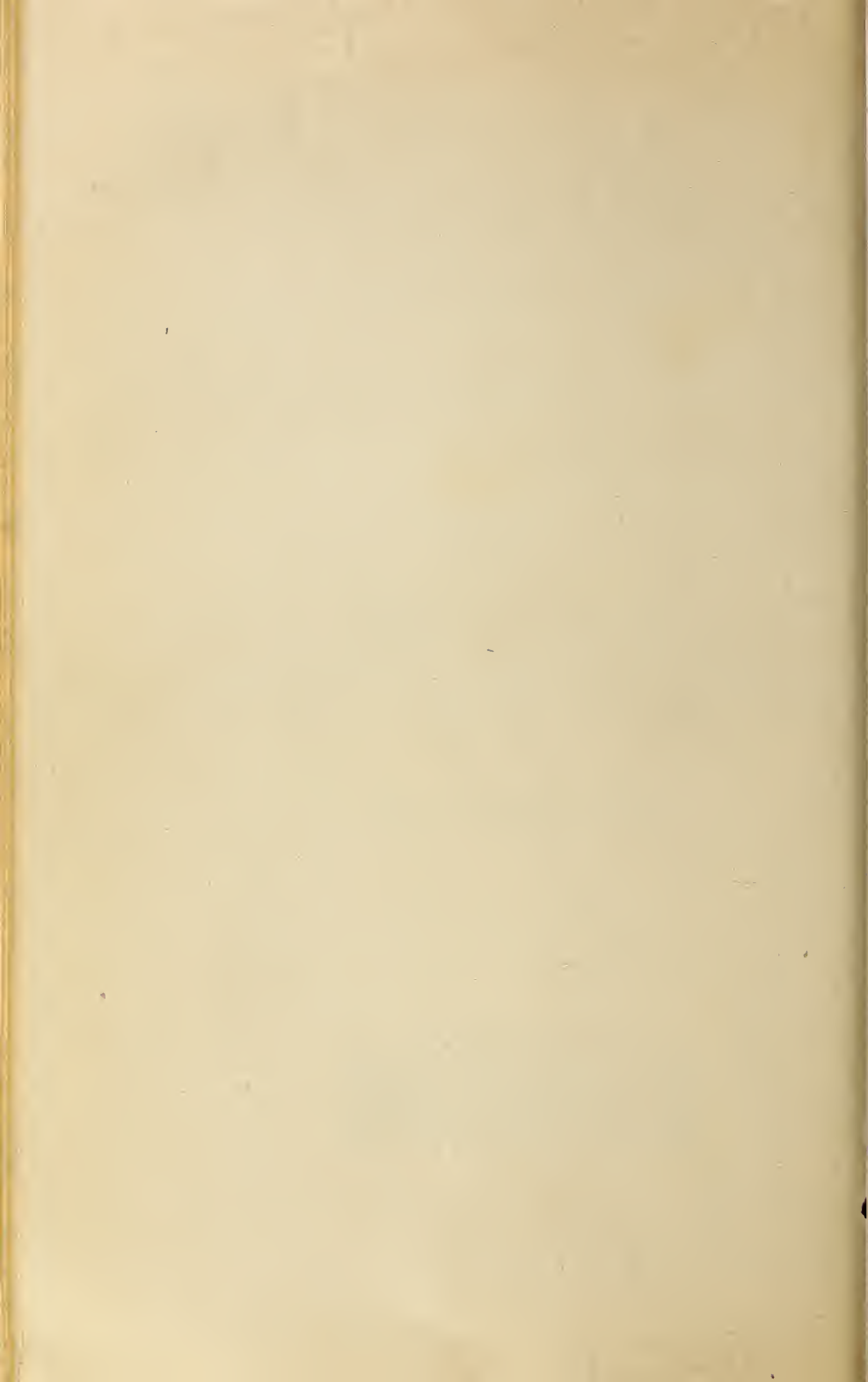


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# THE AGRICULTURAL SITUATION FOR 1918

A SERIES OF STATEMENTS PREPARED UNDER THE  
DIRECTION OF THE SECRETARY OF AGRICULTURE

## PART I HOGS

HOG PRODUCTION SHOULD BE INCREASED



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PUBLICATIONS OF THE DEPARTMENT OF AGRICULTURE RELATING  
TO SWINE.

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FARMERS' BULLETINS.

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# HOG PRODUCTION SHOULD BE INCREASED.

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## SUPPLY OF HOGS AND PORK PRODUCTS LESS THAN IN 1916.

PORK PRODUCTION is of paramount importance at this time, when the United States faces a shortage of hogs and the Allies are depending upon us to furnish greater quantities of pork products to supplement their greatly depleted larder. The gravity of the situation should not be underestimated. Pork constitutes more than one-half of all the meat produced in the United States, and it is the mainstay of the ration of the laboring man and the soldier. The need for increasing the supply of fats is particularly acute. Fats in all forms—dairy products, beef fats, vegetable oils, and pork fats—should be increased to meet the demands of this country and the Allies. This can be done more quickly by increasing the number of hogs than in any other manner. Hogs require less labor, equipment and capital, make greater gains per hundredweight of concentrates fed, and give a quicker turn-over of money than any kind of live stock except poultry. Pork products also have a further advantage of being easily transported.

The increase in the number of stock hogs in the country in 1916 was not maintained; in fact, there was a falling off of 5,427,000, or about 7 per cent, to 60,218,000. The decrease in the supplies in the Allied countries, however, has been tremendous, and it is expected the slaughter will continue at an accelerated rate.

The situation also is reflected somewhat in the increased exports of pork products from this country. Before the war (1910-1914), we exported on the average about 900,000,000 pounds yearly, of which about one-half was lard; during 1917 exports increased to 1,417,000,000 pounds. The increase consisted entirely of meat, the exports of lard remaining about the same.

*Hogs and pork products in the United States, 1916 and 1917.*

[Number of stock hogs for September 1; other figures for year ending September 1.]

Item.	1916	1917
Number of stock hogs on hand in the United States Sept. 1.....	65,645,000	60,218,000
Number of hogs slaughtered during the year (estimated).....	66,000,000	61,000,000
Average live weight of hogs slaughtered, in pounds per hog (estimated).....	223	225
Average dressed weight (75 per cent of live weight), in pounds per hog (estimated).....	167.3	168.7
Total pounds of dressed hogs.....	11,042,000,000	10,092,000,000
Exports of pork products, in pounds.....	1,417,000,000	1,446,000,000
Domestic consumption, in pounds.....	9,625,000,000	8,844,000,000
Pork products consumed per capita, in pounds.....	94.5	85.4

Fortunately it is possible to increase the number of hogs very rapidly; in fact, hogs reproduce more quickly than any other meat animal, the average annual rate easily possible for brood sows being about two litters of five pigs each. The hog is also the most economical animal to feed. An investigation has shown that 52.9 per cent of feed consumed by hogs goes to growth, 35.3 per cent to maintenance, and only 11.8 per cent to waste. The corresponding figures for sheep are 25.0 per cent for growth, 45.8 per cent maintenance, and 29.2 per cent waste. For cattle, 19.6 per cent goes to growth and milk production, 36.4 per cent to maintenance, and 44 per cent to waste. These figures show another reason why much of our abundant crops should be fed to hogs.

**AMPLE GRAIN FOR INCREASED HOG SUPPLY.**

The total cereal crop harvested in the United States in 1917, much of which is available for feeding hogs, is far above the yield in 1916. Take corn, of which the greatest proportion always is fed to live stock. The December estimate made by the United States Department of Agriculture showed a total crop of approximately 3,159,494,000 bushels, compared with an estimated yield of 2,566,927,000 bushels last year, and a five-year (1911-1915) average yield of 2,754,164,000 bushels. We thus have available 592,567,000 bushels more than last year, and 405,330,000 in excess of the five-year average; however, more than 20 per cent of the corn crop of 1917 is soft and must be fed where it is grown. Ordinarily 95 per cent of the entire crop matures, although about seven million acres annually are in danger of freezing, according to the Bureau of Crop Estimates. This year only 71 per cent of the crop matured, whereas in 1915, when the crop



in many ways compared closely with that of 1917, the percentage of mature corn was 72.

In the leading corn producing States 57 per cent was matured against 58 per cent two years earlier and 92 per cent as the normal. The greatest amount of soft corn is in the Northern States, although the condition is termed "spotted," and corn was frosted in some localities as far south as Tennessee. In general, however, there is a heavy corn crop in the South which is in good condition, as well as in parts of the North, and it is ample for live stock as well as for human food requirements. The accompanying table shows the situation in more detail.

*Maturity of corn crop, 1917, 1915, and usual, at time of killing frost.*

State.	Fully matured.			Dough stage.			Milk stage or earlier.		
	1917	1915	Usual year.	1917	1915	Usual year.	1917	1915	Usual year.
	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
Ohio.....	55			30			15		
Indiana.....	55	80	93	27	16	6	18	4	1
Illinois.....	48	68	92	32	22	7	20	10	1
Michigan.....	11	35	87	42	42	10	47	23	3
Wisconsin.....	14	10	83	43	44	12	43	46	5
Minnesota.....	22	10	86	42	44	10	36	46	4
Iowa.....	45	25	88	25	42	10	30	33	2
Missouri.....	80	93	98	15	7	2	5	0	0
North Dakota.....	10	8	60	35	35	25	55	57	15
South Dakota.....		26	84		34	11		40	5
Nebraska.....	80	47	93	15	36	7	5	17	0
Kansas.....	81			15			4		
Averages for States shown.....	57	58	92	27	25	7	16	17	2
Averages for entire U. S. crop.....	71	72	95	18	17	4	11	11	1

State.	Fit to husk.			Fit for seed.			Total loss from frost damage.					
	1917	1915	Usual year.	1917	1915	Usual year.	To yield.			To quality.		
	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	1917	1916	Usual year.	1917	1916	Usual year.
Ohio.....	56			26			12			28		
Indiana.....	65	90	95	20	60	85	25	10	5	35	15	5
Illinois.....	49	83	97	29	35	60	26	14	3	38	23	6
Michigan.....	30	59	94	4	8	37	45	30	7	62	47	9
Wisconsin.....	24	24	88	6	4	36	48	52	11	58	64	11
Minnesota.....	42	28	77	11	5	58	45	48	8	52	64	8
Iowa.....	50	32	83	20	14	51	25	37	6	40	55	3
Missouri.....	67	93	98	39	45	55	6	5	2	11	10	3
North Dakota.....	15	15	60	1	2	35	55	60	20	60	60	20
South Dakota.....	74	58	98		15	59		38	9		59	13
Nebraska.....	100	88	98		30	72		20			31	
Kansas.....	82			31			7			14		
Averages for States shown <sup>1</sup> .....	58	71	93	26	35	60	20	20	5	31	31	5
Averages for entire U. S. crop <sup>2</sup> .....	72	81	95	50	50	77	14	14	3	21	20	3

<sup>1</sup> Allowance made for damage in Ohio and Kansas, November, 1915, and usual year.

<sup>2</sup> Allowance made for damage in other States.

Besides corn, there is a larger supply of other grains than in 1916. We have over 335,449,000 bushels more of oats, 26,666,000 more of barley, and 11,283,000 more of rye, or, including corn, an excess of about 965,965,000 bushels of grains. The amount of the 1916 corn crop held over for feeding last fall and this winter, however, was only 34,745,000 bushels compared with last year's hold-over of 87,908,000 bushels, and the shortage of oats and barley on farms was about 53,163,000 bushels, making the total shortage in the carry-over about 126,341,000 bushels. Making deductions from the total increase, we still have a net increase of 839,624,000 bushels of cereals. This may be shown in tabular form as follows:

*Cereal increases of 1917 over 1916.<sup>1</sup>*

Increase in crops:	Bushels.
Corn .....	592,567,000
Oats .....	335,449,000
Barley .....	26,666,000
Rye .....	11,283,000
<hr/>	
Total crop increases.....	965,965,000
Decrease in stocks of old corn, oats, and barley on farms.....	126,341,000
<hr/>	
Net increase in grain supply.....	839,624,000

Thus there is a surplus of grain which must be fed to live stock, and the duty of the American farmers to themselves and to the Nation is clear. Live stock production, especially hog raising, must be increased.

### FIFTEEN PER CENT MORE HOGS NEEDED.

And if hog production is to keep pace with the expansion in supplies of feed, we must have an increase of at least 15 per cent in the number of hogs within the ensuing year. This is the amount which the Department of Agriculture, in conference with many of the State agricultural institutions and farmers, set last fall as the minimum average increase needed in the United States. In order to reach this goal, of course, many States will have to increase their supply much more

<sup>1</sup>The total crops of corn grown in 1917 and 1916, respectively, were 3,159,494,000 and 2,566,927,000 bushels; oats 1,587,286,000 and 1,251,837,000; barley 208,975,000 and 182,309,000; and rye 60,145,000 and 48,863,000.



than this amount—some as much as 30 to 50 per cent. The following statement shows the percentage:

Missouri .....	50	Nebraska .....	20	South Carolina ...	15
Alabama .....	30	Arkansas .....	20	South Dakota.....	10
Kansas .....	25	Mississippi .....	20	Maryland .....	10
Iowa .....	25	Ohio .....	15	North Carolina ..	10
Illinois .....	20	Kentucky .....	15	West Virginia ...	5
Indiana .....	20	Tennessee .....	15	Georgia .....	5

It is expected that in the States not named, the supply of hogs will be maintained if not increased. The increase in the number of hogs in the Northwestern States should be large. In the New England States, where only about two hogs are kept per farm, the increase also should be great.

Meetings were held throughout the fall and early winter in the areas where swine production is to be increased heavily. These were attended by Federal and State specialists in swine husbandry, farmers interested in hog production, as well as others conducting general, livestock or dairy farming. At all of these meetings the program for increasing the number of hogs in the country was received enthusiastically and at many meetings resolutions were passed supporting the program.

The supply of breeding sows was undoubtedly short last fall. The breeding ranks for the fall and early winter had to be filled to a considerable extent with gilts from the feed lots. These gilts will not produce quite so large litters as mature sows. Therefore, farmers using gilts were requested to breed slightly above the prescribed quotas in order to insure the requisite increase in spring pigs. Those having old brood sows should continue to breed them a year longer or at least for another litter.

As is the case with many major farm products, the production of hogs on a large scale is confined to a comparatively small area in the United States. In fact, the census shows that 34 per cent of the swine in 1909 were found in 257 counties, each of which contained 50,000 head or more, and all these counties are in 10 States. Further, hogs are kept on only about two-thirds of the farms in this country and a glance at the accompanying graphs, made up from census returns, shows a very great similarity between the distribution of the hog population and the corn production.

The accompanying table shows there is a large increase over the 1916 corn crop in the States in which heavy increases in the number of hogs are expected. In the Southern States the increase in the corn

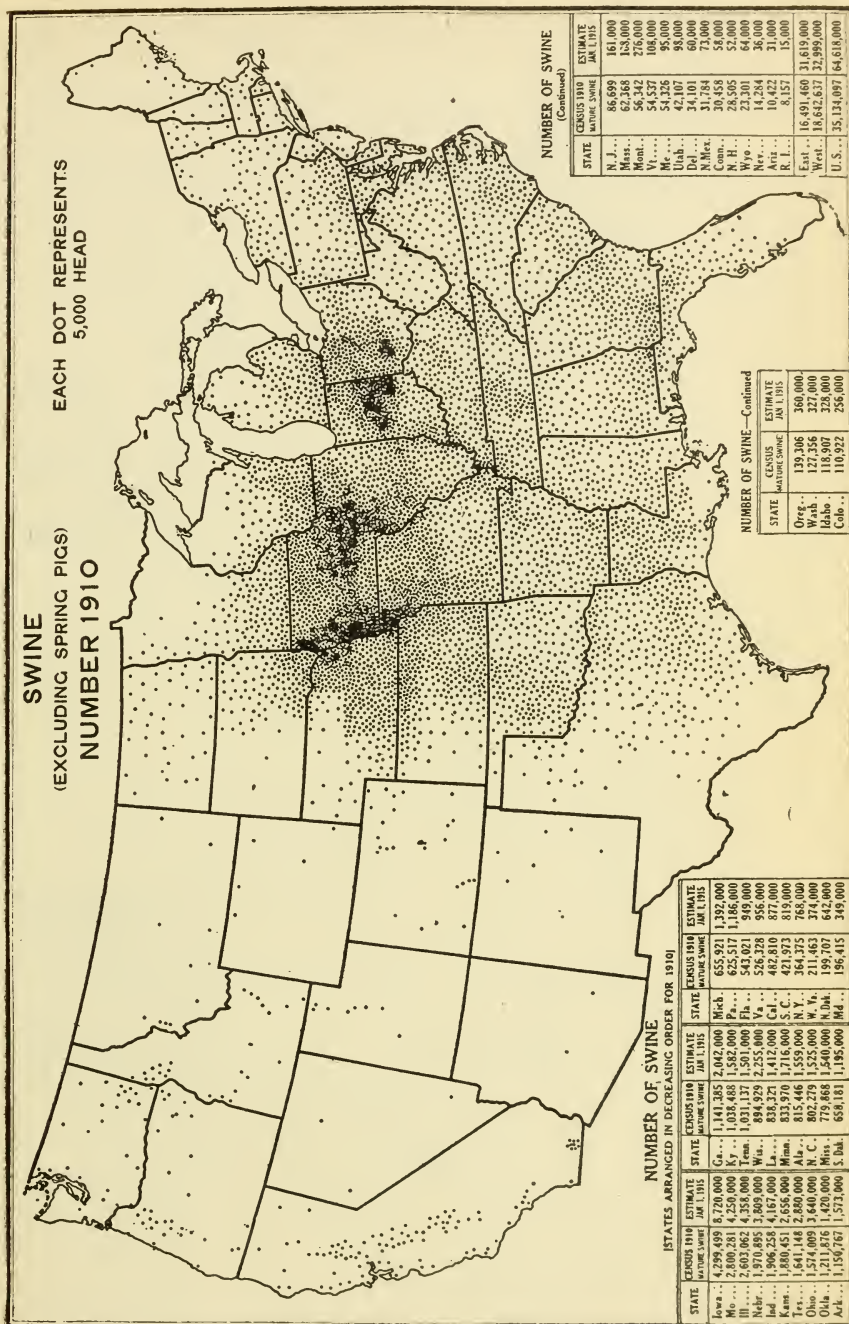
crop is approximately 22 per cent of the total increase in the entire country.

*Southern corn crop.*

State.	1917	1916	Increase, 1917.	Decrease, 1917.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Maryland .....	28,080,000	26,325,000	1,755,000	
Virginia .....	72,275,000	58,800,000	13,475,000	
West Virginia .....	25,020,000	22,570,000	2,450,000	
North Carolina .....	60,000,000	48,100,000	11,900,000	
South Carolina .....	43,947,000	32,008,000	11,939,000	
Georgia .....	72,000,000	62,000,000	10,000,000	
Florida .....	13,875,000	12,300,000	1,575,000	
Kentucky .....	122,850,000	95,200,000	27,650,000	
Tennessee .....	111,150,000	78,000,000	33,150,000	
Alabama .....	77,200,000	47,812,000	29,388,000	
Mississippi .....	84,050,000	47,600,000	36,450,000	
Louisiana .....	42,246,000	44,814,000		2,568,000
Texas .....	77,825,000	129,200,000		51,375,000
Oklahoma .....	33,150,000	53,325,000		20,175,000
Arkansas .....	67,200,000	45,135,000	22,065,000	
Total .....	930,868,000	803,189,000	201,797,000	74,118,000
Net increase .....			127,679,000	

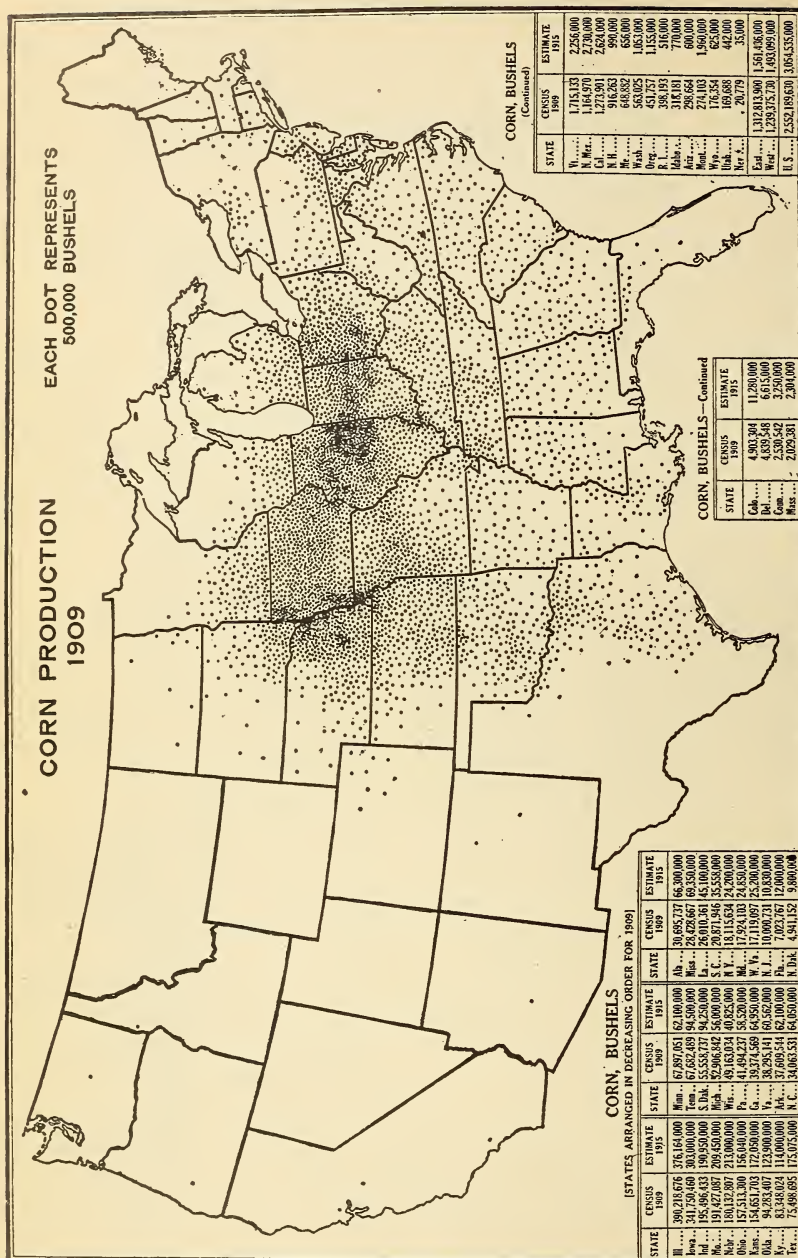
*Corn crop in certain Northern States.*

State.	1917	1916	Increase, 1917.
	<i>Bushels.</i>	<i>Bushels.</i>	<i>Bushels.</i>
Ohio .....	150,100,000	113,400,000	36,700,000
Indiana .....	203,436,000	174,658,000	28,778,000
Illinois .....	418,000,000	300,900,000	117,100,000
Iowa .....	410,700,000	366,825,000	45,947,000
Missouri .....	252,000,000	132,112,000	131,088,000
South Dakota .....	97,150,000	84,075,000	8,437,000
Nebraska .....	249,480,000	192,400,000	67,340,000
Kansas .....	128,184,000	69,500,000	58,936,000



Compare with map of corn, in which the areas of densest corn production are shown to be about the same as the areas of densest hog production.





Compare with map of swine and note the close relation between corn production and swine production. The maps are based on census figures, but the Department's 1915 estimates, given in the inset tables, show the same relation.

### MINIMUM PRICE TO STIMULATE PRODUCTION.

With a view to stimulating the production of hogs, the United States Food Administration announced in early November that the average price of hogs on the hoof in the packers' yards at Chicago, so far as the Food Administration is able to affect it through control of the buying for the Allies, our Army and Navy, the Red Cross, the Belgian Relief, and the neutrals, would not go below a minimum of \$15.50 per 100 pounds until further notice. Furthermore, it has said as to hogs farrowed next spring: "We will try to stabilize the price so that the farmer can count on getting for each 100 pounds of hogs ready for market 13 times the average cost per bushel of the corn fed into the hogs". This price for hogs was adopted because over a series of years the price of hogs per 100 pounds on the average has represented the cost of about 12 bushels of corn. But in order to encourage farmers to breed hogs during the fall and winter and therefore to increase quickly the amount of pork available, an allowance of 13 bushels of corn per 100 pounds of pork was made. Thus if a hog sells at \$15.50 per 100 pounds and 13 bushels are used in its feeding and no allowance for the labor, etc., is made, it could be figured that the return on the corn consumed was about \$1.20 per bushel. But it is entirely possible to feed other and cheaper feeds than corn to hogs and thus make a substantial profit as well as paying for all labor involved. Then, too, a good feeder can make 100 pounds of pork by feeding much less than 13 bushels of corn and by utilizing roughage and other feeds.

The purpose of establishing a ratio between hog prices and corn was to stimulate hog production during the coming season. It was not intended so much to hold prices to a high level as it was to prevent the sudden and disastrous fluctuations which have been so discouraging in the past.

### PRESERVATION OF BREEDING ANIMALS NECESSARY.

It is difficult to comprehend the true significance of the great war in which this country is engaged, and it is still more difficult to forecast coming events. Among the facts that stand out clearly, however, is the need of preservation of breeding animals on farms. This is important to every nation. Countries in Europe have been forced to tap this supply heavily, so great has been the demand for meat and fats. This country's duty is to husband its fundamental resources, such as its breeding stock, to meet the unprecedented demands of the future. The world's supply of meats, fats, wool, and leather has been rapidly disappearing. The needs will increase as the war progresses. And even after the war, breeding stock will be in demand for restocking the wasted herds and flocks. The farmer will reap a benefit by con-

serving his breeders and by selling, while the war continues, stock not fit for breeding but which has been fed to the proper weight. Particularly in the case of hogs, it is economy not to market them when too young and light weight.

### MARKET HOGS AT HEAVIER WEIGHTS.

While the little pig makes a pound for pound gain on less feed than the older hog, there are advantages from both an individual and a national standpoint in feeding hogs to a heavier weight. Animal fats are needed. No way exists of increasing the supply more rapidly than by building up the number of swine in the country. And as every farmer knows, it's the heavy hog that carries the fat. The need for fat also was reflected in the market in December by a wider spread in prices paid for receipts, the fat hogs topping the market.

Market reports for early winter also showed that hogs were being sent to packing centers at a much heavier average weight than has been the custom for some time, thus indicating that farmers were finding it profitable as well as patriotic to put more fat on their hogs. The feeding for more weight has been done by the farmers in direct response to the many requests that hog production be increased. It was impossible to enlarge the number of hogs immediately; that will come with the spring litters, and again in the fall. It was possible, however, to add weight to the hogs on hand. An abundance of feed, although in some localities of poor quality, has greatly favored farmers, and those favorably situated should feed hogs until they weigh from 250 to 300 pounds. Not only have they kept hogs on their farms until the animals carried weight, but the demand at packing centers for feeder or light-weight hogs to be shipped back to the country was unprecedented during the early winter.

Those who have to buy feed or find it necessary to economize on feed which they have purchased may find it more to their advantage to market hogs at lighter weight because of the relative slowness and higher cost of putting flesh and fat on heavy hogs. A weight of about 200 pounds may be attained at from 10 to 11 months of age.

### SELF FEEDERS ARE ECONOMICAL.

Swine farming, like other branches of live stock farming, gives employment to labor during the entire year, enables the farmer to keep hired labor throughout the year, and does not congest it at harvest time. This is particularly important during the present emergency, when help is scarce in many localities. The hog is the only farm animal that can safely be put into the field to harvest the corn crop,



and this practice is gaining favor among farmers because of the labor saved by the breeder who grows his own corn.

Possibly even more popular is the self-feeder for fattening hogs. By this device much labor is saved and the hog is required to feed himself from the feeder, which is kept constantly available and full of concentrated feeds, such as corn, meal, tankage, etc. Thus with the ingredients of a good ration constantly before them, hogs will make gains more rapidly and more economically than when fed by hand. The time needed to bring them to a certain weight—an extremely important item at this time when there is a shortage of pork and an abundance of feed—will be shortened. Results of many experiments have proved these facts.

A compilation and average made by the United States Department of Agriculture of the results obtained with the self-feeder at numerous experiment stations in this country, in feeding a total of nearly 600 pigs, shows conclusively that more rapid gains are made with the self-feeder than with the best hand-feeding methods, partly owing to the larger daily consumption of feed per head, 8 pounds compared to 5.47 pounds, and partly owing to the more efficient use of the grain fed, resulting in a saving in the amount of feed necessary to produce 100 pounds of gain.

*Average results with self-feeders at experiment stations.*

Number of pigs.	Method of feeding.	Average days fed.	Average daily gain per head.	Average daily feed per head.	Average amount of feed per 100 pounds of gain.
262	Hand-fed . . . .	82.2	<i>Pounds.</i> 1.23	<i>Pounds.</i> 5.47	<i>Pounds.</i> 445
332	Self-fed . . . .	68.5	1.92	8	417

### THE HOG SAVES WASTE.

The hog had to earn his sobriquet, the "mortgage lifter." He was given this nickname because he is a profitable animal when grown as a crop by himself, and because of his ability to turn into a profit feeds which otherwise would be lost. Thus he saves waste and utilizes materials around the farm which only he can use and converts these into a marketable product and cash.

On farms where steers are fed, hogs should be found in increasing numbers. Pork made by allowing hogs to follow grain-fed steers and utilize the grain in their droppings is not only cheap pork, but it is made at a minimum of labor and almost as a by-product of the steer-feeding industry. It has been estimated that the grain picked up by pigs following steers pays for from 1 to 16½ per cent of the feed given

to the steers. In an experiment at the Indiana experiment station the shotes made this gain without additional feed.

### DISPOSAL OF CITY GARBAGE BY FEEDING TO HOGS.

In a number of cities the garbage is systematically collected and fed to hogs and another product thus is turned from a waste to a profit. With the high prices ruling for both feeds and pork, the collection of city garbage for hog feeding becomes much more important. In fact, at no time in our history has the elimination of waste been a more emphatic necessity than at present. If, entirely aside from effecting an economy in city management, the garbage produced in cities and towns can be used profitably in pork production, every effort should be made to convert it to this purpose.

Reports in the possession of the Department of Agriculture show that where table scraps form a part or all of the pig's diet, the gains cost considerably less than the gains made by their grain-fed competitors. On the other hand, while many people recognize in hog feeding the possibility of a cheaper disposal of garbage than by rendering, incinerating, dumping, etc., there is no reliable and complete source of information on the subject. It has been the experience of many feeders of city garbage, however, that it is advisable to immunize their hogs against cholera and thus reduce the danger of introducing infection.

The report of a special commission on the "Collection and Disposal of Municipal Waste," Worcester, Massachusetts, shows the cost per capita per annum for the collection and disposal of garbage in 17 cities of the United States. Seven of these cities feed their garbage to hogs; the other 10 dispose of it by other methods, such as incineration, reduction, burial, etc. The average cost per capita per annum for those feeding garbage is about \$0.116, and the average cost for the other 10 \$0.337, a saving of \$0.221 per capita per annum.

If these averages are confirmed by reports from a large number of cities, it would seem that hogs as garbage converters could directly save the people in the cities of the United States enormous sums of money annually, and add a considerable amount to the meat supply of the Nation. While these averages can not be taken as absolute for the whole country, they are a strong indication of the possibilities.

### PIG CLUBS ENCOURAGE PRODUCTION.

One of the most potent ways of increasing the number of hogs is by encouraging more boys and girls to join pig clubs. In the past these clubs have been markedly successful. They have been the means of introducing pure-bred hogs into many communities and raising

the standard of hogs as well as improving the conditions under which they are kept and the care given them. The number of pig clubs in the Northern States on June 30, 1917, totaled 1,037; in the South the number of community clubs is between 2,000 and 2,500, and in almost every club are found members of pig clubs. Although the number is large, it is possible to increase it greatly by forming more clubs in counties where there are agents to direct properly the efforts of the young people. In order to stimulate these activities, the Department during the past year has added to its force several pig club specialists and a number of the agricultural colleges have done likewise. In this work, it is of first importance that proper instructions be given to the members in regard to all phases of swine husbandry so that clubs will be successful in bringing to market a large percentage of the pigs under their care. Clubs should not be organized unless there is ample assurance that sufficient feed will be available to bring the pigs to maturity.

#### **SWINE BREEDERS ASSIST CLUB MEMBERS.**

Swine breeders' associations have been active for a number of years in assisting pig club members to secure pure-bred hogs at reduced prices. This has made it possible for members to obtain good stock with which to lay the foundation for a herd of pure-bred swine. The result has been the introduction into many communities of desirable breeding stock and the stimulation of more widespread interest in good quality hogs. Swine breeders' associations doubtless will be willing to continue in the future the assistance given to club members in the past.

#### **BANKERS AID PIG CLUBS.**

Bankers in many States have realized the value of pig clubs as a means of materially improving rural conditions and at the same time increasing the production of meat and teaching the members good business methods. Not a few bankers have made it possible for worthy club members to secure pigs on their personal notes. In this way a well-bred pig is obtained through the efforts of a county agent or pig club leader or specialist and a banker. The member is given the opportunity to pay for it from the proceeds of the pig as a meat animal or from the sale of offspring in case of a breeding animal. Often the member enters into a business agreement (with the parents' consent) with the banker and thus secures a pig when otherwise it would have been impossible for the child to have joined the club.

In other instances the bankers have bought bred gilts or gilts to be bred and given them to club members with the understanding that



two pigs were to be returned for the original gilt loaned. These pigs in turn are lent to other children. This plan is the so-called endless chain contract. Either plan has resulted in increasing interest in pig clubs with its accompanying expansion in the supply of pork products and the instruction in swine husbandry which is a part of the club work. The banker thus helps to lay a foundation for a prosperity which will be lasting. The money received from the sale of hogs will be expended in further developing the county. Every merchant in the county will profit, the banks will get more deposits, and the farmers will have more money with which further to develop their farms.

#### PASTURE HELPS REDUCE COST OF PORK.

Although corn constitutes a large proportion of the feed given to hogs, the cost of producing pork may be materially reduced by the use of pasture and forage crops, supplemented by grains. Rape, soy beans, cow peas, peanuts, alfalfa, clover, vetch, rye, oats, and Canada field peas are all valuable forage crops for swine of any age. In general, the grain ration which is suited to be fed with the legumes is corn and barley, etc.; with the non-legume plants, a small amount of nitrogenous feed, such as tankage or oil meal, is advisable.

As a general rule, if rapid gains are desired, a full ration of grain is fed along with the forage, but if economy in feeding is to be practiced smaller proportions of grain will be better. In some sections of the country, where pastures are luxuriant, mature hogs are maintained in apparently satisfactory condition on pasture alone. This practice should not be followed, however, in the case of young, growing pigs, because they will become thin in flesh and stunted if compelled to live on pasture alone.

In a feeding test extending over three summers at the Missouri experiment station, forage crops demonstrated their value. Ten pounds of gain were accredited to each bushel of corn consumed before gains were accredited to forage crops. Grain was fed at the rate of 2 or 3 per cent of the weight of the hogs. For each acre pastured alfalfa produced 596 pounds of pork; corn 395; rape, oats, and clover 394; sorghum 370; blue grass 295; rye grain 244; cow peas 224, and soy beans 183.

Hog raisers differ widely regarding the quantity of grain that should be fed to hogs while on pasture. Some feeders give them all they will consume; others about 2 to 3 per cent of the live weight of the hog. Still others will allow pigs to run on pasture and feed them a 1 per cent grain ration. There is no fixed rule governing the supplemental grain ration which should be fed in combination with forage. The

amount of grain fed depends upon the kind of pasture used, the price of grain, and the market. When a farmer has more hogs than his pasture will accommodate, the pasture will last longer if a full grain ration is fed.

When grain is high, it is rather expensive to feed a supplemental grain ration. At such times there is a great temptation to place the hogs upon pasture alone. This practice will hardly ever pay, for it generally takes more grain and more time to finish off the hogs than if they had been fed a liberal ration while on pasture.

The amount of grain used also will depend upon the length of time the feeder has in which to fit the hogs for market. Hogs that are marketed from 10 to 12 months old are usually maintained on pasture alone during the grazing season. If any grain is given at all it is very light. In this way the greater percentage of growth is made from the cheaply grown forage. Where rapid finishing is desired, the liberal use of grain is important.

Permanent pastures also play an important part in a forage-crop succession. Such pastures as alfalfa, the clovers, blue grass, Bermuda, and a number of others, have their greatest use during the summer, when few temporary crops, such as corn, soy beans, cow peas, and velvet beans, are available. Permanent pastures do not furnish grazing as early in the spring as do the cereals, but they grow better during late spring and summer and afford an abundance of forage at a season when few other pasture crops are ready to graze. A permanent pasture then takes the place of a reserve forage crop, being called upon to furnish grazing at any time of the year when other pastures fail or are exhausted.

Dry-lot rations are not usually satisfactory from a financial standpoint. Corn ordinarily forms the basis of the ration, with protein supplied from one of the concentrates, such as mill feeds, oil meal, soy beans, alfalfa, or like feeds. Where milk is available it is frequently fed to hogs to advantage, but under present conditions much of the skim milk which has been given to hogs should now be manufactured into cheese.

When fed in the dry lot, a common custom is to give the pigs all the feed they will clean up in a reasonably short time. For a pig weighing 15 to 50 pounds live weight, a full ration for one day is about 6 pounds of grain for each 100 pounds of weight; for larger pigs the ration will continue to grow smaller in proportion to weight until the 300 to 350 pound pig will only consume a daily ration equal to about 2.4 per cent of his weight.

### REDUCE LOSSES FROM DISEASE.

In the problem of conserving and increasing pork production, it must be remembered that one of the chief factors is the prevention of disease. Swine, particularly young animals, are susceptible or subject to ailments which, if not remedied, checked, or prevented, will result in the curtailment of production, despite all efforts that may be made.

Diseases of swine may be classed in two groups: (a) Ailments which are not highly destructive and can be treated as a rule by the farmer; (b) highly destructive diseases, particularly of infectious origin, which spread rapidly and kill quickly, and to handle them properly requires the cooperation of not only the farmers and stock raisers, but Federal and State officials.

In the first group which is not highly destructive may be mentioned such ailments and conditions as parasites, both internal and external (worms and lice); mange and other skin diseases; tumors and abscesses; poisoning by such agents as caustic potash and mold in garbage, cocklebur, cotton seed, etc.; pneumonia; thumps, or other digestive disorders. These ailments as a rule can be readily treated by efforts of the farmer himself, and the application of home remedies often proves effective in their cure. Preventive measures at all times should be observed, such as proper housing and feeding, sanitary condition of yards and shelter, good clean drinking water, and above all the elimination of filthy mud holes.

#### HOG CHOLERA.

Of the second group, the most destructive ailment of swine is hog cholera, which kills approximately 90 per cent of all hogs that die of disease. It is caused by a germ readily transmitted from sick to well hogs and may, at times, remain active in the soil and other materials for long periods. Hog cholera has taken from the swine raisers an average toll of \$30,000,000 annually, for the past 40 years, and the loss has been as high as \$65,000,000 in a single year. Thus for years the hog industry has been greatly handicapped. The enormous number of animals destroyed has been due largely to the rapid spread of the disease and the inability of farmers to recognize the ailment, and in many instances to the lack of attention to proper precautions to prevent its introduction. The symptoms of hog cholera are not such as readily to distinguish it from certain other diseases of swine, and a sick pig always should be regarded as a possible danger to the entire herd. Therefore any pig showing signs of illness should be separated from the other animals.



## SERUM TREATMENT.

The principal factor of hog cholera prevention is the preventive serum treatment developed by the Bureau of Animal Industry. It is the only sure protection against hog cholera and while its chief property is as an immunizing agent, it has certain curative value in the early stage of the disease, in the majority of instances.

There are two methods of this treatment. The simple method, serum alone, cannot convey hog cholera, but protects animals so treated for a limited period only, ranging from three weeks to three months. The other method, simultaneous inoculation, consists of the injection of serum at one point and a small dose of hog cholera virus at some other point, usually in the opposite side of the animal. The great advantage of this method is that it gives permanent protection to animals of all ages, in practically all instances. However, this involves the use of virus, the active agent of the disease itself. If improperly administered, or if the serum be of low potency, or if an insufficient dose of the serum is given, it may result in the development of cholera. This method of treatment therefore should be entrusted only to skilled persons competent to make a proper diagnosis and able to differentiate hog cholera from other diseases.

## FIELD WORK BY THE DEPARTMENT.

Until 1913, a few years after the development of anti-hog-cholera serum by the Bureau of Animal Industry, no effective results had been achieved in the control of the disease; in fact, only very feeble efforts had been attempted. In that year, however, experiments were inaugurated by the Federal Department of Agriculture in cooperation with State authorities in a few localities to demonstrate the possibility of reducing losses from cholera by the serum treatment properly applied and supplemented by sanitary measures on the farm. From those experiments has grown the present status of hog cholera control as conducted by the Department in cooperation with State officials charged with or interested in the suppression and eradication of infectious and contagious diseases of live stock. Work of this character is now carried on in 29 States and a force of 140 trained veterinarians under the direction of the Bureau of Animal Industry is actively engaged in assisting the State forces charged with the enforcement of regulations, investigations, and control measures, as well as the educational force in the dissemination of information to farmers and stock raisers through lectures, demonstrations, and other means.

In the last two years losses from the disease have been reduced over 50 per cent, and from field reports the indications are that losses will be further reduced during the present season. The work already

accomplished by the Department of Agriculture and State authorities has fully demonstrated that losses can be reduced and hog cholera controlled by the intelligent use of anti-hog-cholera serum and the proper application of quarantine and sanitary measures. However, in order to pursue the work still further, it will be necessary, as in the past, to have the support and cooperation of farmers, stock raisers, and others interested in the suppression and control of infectious and contagious diseases of live stock. Outbreaks of hog cholera should be promptly reported to the proper State authorities, either directly by wire or through the county agent or local veterinarian; infected hogs should be restricted; neighbors should be warned of infection; dead hogs should be properly disposed of; and sick ones treated as early as possible.

Anti-hog-cholera serum is produced by a number of agricultural colleges and by numerous commercial firms operating under license from the United States Department of Agriculture which requires that a label be placed on the serum containers showing the license number and a serial number so that any consignment of serum can be investigated, if need arises. Farmers should know how and where to obtain serum promptly in case of need and where to secure a competent man to administer the treatment.

The following maxims are formulated that farmers and others may know of methods of prevention.

#### TO KEEP HOG CHOLERA FROM REACHING YOUR HERD.

Locate your hog lots and pastures away from streams and public highways, and do not allow your hogs to run on free range or highways or to have access to canals or irrigation ditches.

Do not visit your neighbor's farm nor allow him to visit you if he has hog cholera on his premises.

Do not drive into hog lots after driving on public highways.

Do not use hog lots for yarding wagons and farm implements.

Do not place newly purchased stock, stock procured or borrowed for breeding purposes, or stock exhibited at fairs immediately with your herd. Keep such stock quarantined in separate pens for at least two weeks, and use care in feeding and attending stock to prevent carrying infections from these to other pens.

Burn to ashes or cover with quicklime and bury under 4 feet of earth all dead animals and the viscera removed from animals at butchering time, because they attract buzzards, dogs, etc., which are liable to carry hog-cholera infection.

If hog cholera appears in the neighborhood confine your dog and encourage your neighbor to do the same.

Mange, lice, and worms lower the vitality of hogs, rendering them more susceptible to disease.

#### IF HOG CHOLERA APPEARS IN YOUR HERD.

Have all hogs treated immediately with anti-hog-cholera serum, after which they should be kept on a light diet, with pure drinking water, and confined to limited quarters that should be cleaned and sprayed 3 times a week with 1 part of compound cresol solution to 30 parts of water until the disease has abated in the herd.

To obtain the best results the serum must be administered as soon as the disease is detected in the herd. Be sure that the temperature of all hogs is taken. A temperature above 104 degrees in ordinary weather and when the animal is not excited indicates infection, and such hogs require an increased dose of serum.

#### TO RID PREMISES OF INFECTION.

Remove all manure and mix it thoroughly with quicklime.

Burn all litter, rubbish, and old hog troughs.

After the premises are thoroughly cleaned, spray walls, floors, and other surfaces, including remaining hog troughs, etc., with a disinfectant (1 part compound cresol solution to 30 parts water). Where hog houses are small, turn them over, exposing interior to sunlight. Clean premises, properly exposed to sunlight, will not retain infection any great length of time.

Wallow holes and cesspools should be filled in, drained or fenced off.

All runs underneath buildings should be cleaned and disinfected and then boarded up to keep hogs out.

Destroy hogs that do not fully recover, as they may be carriers of cholera infection.

#### NECROBACILLOSIS IN PIGS.

With the diminution of hog cholera, the attention of farmers in various sections is attracted to more or less serious ailments of swine which, in seasons of cholera outbreaks, go unnoticed or possibly are diagnosed as cholera itself. One ailment very prevalent in late spring and summer, especially in pigs, is necrobacillosis. While this disease assumes various forms, the ones commonly noted in herds are necrotic rhinitis, a condition commonly known as "sniffles," and necrotic enteritis. The latter perhaps is the most fatal of the many forms, causing considerable losses in young animals and often mistaken for cholera.

#### NECROTIC RHINITIS.

In the first form mentioned, necrotic rhinitis, the disease assumes a definite type. The lesions are sharply defined by lumps or swellings



occurring on some part of the head or face, usually on the snout. If cut open, these swellings will be found to contain a cheeselike pus or substance having a disagreeable odor. The lesions often extend to the bones of the face, destroying them and causing the animal to assume a "dish-faced" appearance. The pigs so affected eat but little as a rule and sneeze repeatedly, often expelling a bloody material.

In this form of necrobacillosis, treatment to be effective has to be applied in the early stage. When the ailment is noticed before the swelling is large an incision should be made, removing all the pus possible and applying in the opening made, with a syringe, either of the following remedies: Glycerin 15 parts and carbolic acid 1 part, or nitric acid 1 part and water 6 parts, or a 50 per cent solution of iodine. After swelling has become extensive or sloughing of tissues has set in, treatment is of little value and destruction of the animal is recommended.

#### NECROTIC ENTERITIS.

In the second form mentioned, necrotic enteritis, the animals affected develop symptoms somewhat akin to hog cholera. Often there is a lack of appetite, and while diarrhea is not constant, it is frequently noticed in the early development of this form. The pigs become unthrifty, emaciated, and weak. However, the absence of red spots on the bellies and the normal or at times subnormal temperature of the animals differentiate the ailment from cholera. The lesions of the disease will be found most commonly in the mucous membrane or inner lining of the large intestines. In advanced stages the mucous membrane of the small intestines is also involved. Small, white, circumscribed necrotic areas may be seen through the serous membrane or outer covering of large intestines. On splitting the intestine open the mucous membrane will be found thickened, with white necrotic (dead) patches ready to slough. These patches contain a mealy or cheesy substance, and in advanced cases the whole membrane can be easily scraped away. Under this condition food cannot be absorbed and the animal dies from the lack of nutrition.

In this form, as in the first, remedy must be used before the disease has progressed. Feed and so-called stock food and tonics that may contain irritating ingredients should be avoided, green pastures being preferable if available. A physic of oil, such as linseed or castor oil, to clean out the bowels, is recommended. Intestinal antiseptics are in order. The following has been used and found beneficial: Copper sulphate 1 part, hyposulphite of soda 4 parts, charcoal 2 parts, and common salt 6 parts. Give one heaping teaspoonful of this mixture to every 100 pounds of live weight, in slop or milk, night and morning

for about a week. Other antiseptics, such as sulpho-carbolates, iron sulphate, etc., can be used to advantage.

#### CAUSE OF NECROBACILLOSIS.

The origin of all forms of necrobacillosis is the *Bacillus necrophorus*. This organism or germ inhabits the digestive tube of swine, and being expelled in the fecal discharges, it develops and flourishes in damp insanitary quarters. Finally it finds its way into abrasions on lips, face, and mucous membranes of nasal cavities, develops into rhinitis, and later into necrosis or death of large areas about the head and face of the animals. The same organism passing into the intestinal tract sets up there the same process of inflammation, degeneration, and necrosis or death of tissue, resulting in necrotic enteritis.

#### PREVENTION.

In this disease, as in all other diseases of animals, the sane, simple, and effective method to adopt is the one of prevention. While necrobacillosis is not rapidly infectious, still the whole herd is in danger, in that the pigs all have the same supply of germs from which to feed. As in all diseases, the germs of this disease must be destroyed in order to prevent the ailment; therefore the key to prevention in this also is proper sanitation of premises. Frequent and thorough cleaning out of pens, troughs, feeding floors, sheds, and hog lots is an important factor of preventive measures. In addition to thorough cleaning at frequent intervals a liberal quantity of lime should be applied in pens, houses, and adjoining lots. Proper care in feeding also will eliminate much of this trouble. Pigs, shotes, and other hogs should not be allowed to feed from the ground. Suitable feeding floors, preferably of concrete, and troughs of some nonabsorbent material that can be cleaned out, washed and disinfected frequently, are recommended. These equipments, while meaning a little added expense, nevertheless will pay for themselves in a short time, from the saving of feed and the protection of the animals' health. "An ounce of prevention is worth a pound of cure."

#### TUBERCULOSIS.

With the exception of hog cholera, tuberculosis renders more pork unfit for human food than any other disease. In 1916, under Federal inspection, which represents only 60 per cent of hogs slaughtered in the United States, there were found infected with tuberculosis 594,108 hogs, which were condemned in part or in whole, nearly as many as raised in the entire State of New York for that year. Aside from the monetary loss sustained from tuberculosis, the fact that it is trans-

missible to the human makes it doubly important that strict measures for its eradication be inaugurated.

#### HOW TO PREVENT HOG TUBERCULOSIS.

Hogs contract tuberculosis chiefly from dairy cows, which are also very subject to tuberculosis. The disease in a cow infects her milk system, her lungs, and her throat with tubercle bacilli—the germs which cause tuberculosis in men and animals. Some of these germs escape from the cow in her milk or in her droppings, or she may cough them out on feed or bedding. Hogs get the disease from the raw milk or droppings, or feed infected by a tuberculous cow. Pasteurized or cooked milk will not pass the disease from infected cows to other animals.

Therefore, to protect hogs from tuberculosis and to make sure that the feed will be turned into meat instead of into fertilizer—

1. See that all milk, especially all skim milk from the creamery, is pasteurized or cooked before it is fed to the hogs.

2. Keep the hogs from following dairy cattle, unless the cattle are tuberculin tested. Keep them out of cow lots and barns, and keep dairy drainage out of hog lots. Hogs can follow steers without much danger.

3. Give healthy hogs a chance to keep healthy. Give them clean, well-drained lots and plenty of fresh air, sunlight, and clean water. Shelter them in well-lighted and ventilated, sanitary hog houses. Keep the houses clean and use plenty of whitewash and disinfectants.

If there was tuberculosis in your swine last year, it is safest to get rid of that herd, especially the breeding animals, and raise clean hogs from fresh stock.

#### LIVE STOCK RECEIPTS AT CHICAGO TO BE SPREAD OVER THE WEEK.

The Chicago live stock market in recent years has had very heavy receipts of live animals during the first half of the week, especially on Mondays and Wednesdays. To remedy this condition, and distribute the receipts throughout the week, the special committee on national defense of the American Railway Association early in December requested the Bureau of Markets to advise the live stock interests that the railroads entering Chicago have been directed to advise their local agents to accept live stock at points within 300 miles of that city for arrival there on Tuesdays, Thursdays, Fridays, and Saturdays only. Stock from more distant points but requiring not more than 36 hours' running time to reach Chicago are to arrive on Mondays, Wednesdays, Fridays, and Saturdays only. Stock from points still more distant may arrive every day. Shipments of hogs, of course, are subject to this rule equally with other kinds of live stock.





